Claims

1. Arrangement for the determination of the dynamic axle loads and/or the wheel loads of a wheel vehicle (20), with

- a measuring device (1) arranged in the wheel vehicle (20) or which can be arranged in the wheel vehicle, in which case the said measuring device (1) has been developed in such a way that it can measure at least two linear accelerations of a wheel vehicle (20) oriented transversally with respect to each other and three rotation rates of a rotation movement or of a component of a rotation movement around a coordinate axis of the wheel vehicle (20) in each case, in which case the said three coordinate axes extend transversally with respect to each other, and
- an evaluation device (9), which has been connected to and developed with the measuring device (1) and at least one axle load and/or one wheel load, is determined by means of at least two linear accelerations and three rotation rates with the aid of said evaluation device.

2. Arrangement according to claim 1, in which case the measuring device (1) has acceleration sensors (31, 32, 33) in order to measure the linear accelerations and rotation rate sensors (41, 42, 43) to measure the three rotation rates, in which case the said acceleration sensors (31, 32, 33) and the rotation rate sensors (41, 42, 43) are parts of a prefabricated unit (2) embodied in accordance with equipment engineering so that they can be installed in the wheel vehicle (20).

3. Arrangement according to claim 1 or 2, in which case the measuring device (1) has been embodied in such a way that the at least two linear accelerations can be measured as linear measured quantities, which do not depend on each other.

4. Arrangement according to one of the claims 1 to 3, in which case the measuring device (1) has been embodied in such a way that the three coordinate axes extend vertically with respect to each other in pairs.

5. Arrangement according to one of the claims 1 to 4, in which case, in order to measure the rotation rates and to measure the linear accelerations, the measuring sensors of the measuring device (1) are preferably fitted to a vehicle structure (28) moving relative to a running gear (29) of the motor vehicle.

6. Arrangement according to one of the claims 1 to 5, in which case the evaluation device (9) has a computation unit (11), which has been embodied in such a way that by using a measured value measured by the measuring device (1) for a linear acceleration oriented transversally to the plane of a vehicle subsurface (30) at least one part of the axle load and/or a part of the wheel load is calculated.

7. Arrangement according to one of the claims 1 to 6, in which case the evaluation device (9) has a computation unit (11), which has been embodied in such a way that by using the three rotation rates at least one part of the axle load and/or a part of the wheel load is calculated, which is generated by a rotation movement of the wheel vehicle and/or by a rotation movement of a part of the wheel vehicle.

8. Arrangement according to one of the claims 1 to 7, in which case the evaluation device (9) has a computation unit (11), which has been embodied in such a way that, with due consideration of a, in particular damped, suspension (40, 41,

43) between at least one of the wheels (21, 22, 23, 24) of the wheel vehicle (20) and a vehicle structure (28), the axle load and/or the wheel load is calculated.

9. Method for the determination of the dynamic axle loads and/or the wheel loads of a wheel vehicle (20), in which case

- in the wheel vehicle (20) at least two linear accelerations of a wheel vehicle (20) oriented transversally with respect to each other and three rotation rates of a rotation movement or of a component of a rotation movement around a coordinate axis of the wheel vehicle (20) are measured in each case, in which case the said three coordinate axes extend transversally with respect to each, and
- by using the at least two linear accelerations and three rotation rates at least one axle load and/or one wheel load of the wheel vehicle (20) is determined.

10. Method according to claim 9, in which case the linear accelerations are measured with acceleration sensors (31, 32, 33) and the rotation rates with rotation rate sensors (41, 42, 43) and in which case the said acceleration sensors (31, 32, 33) and the rotation rate sensors (41, 42, 43) are parts of a prefabricated unit (1) embodied in accordance with equipment engineering so that they can be installed in the wheel vehicle (20).

11. Method according to claim 9 or 10, in which case the at least two linear accelerations are measured as linear measured quantities, which do not depend on each other.

12. Method according to one of the claims 9 to 11, in which case the three coordinate axes extend vertically with respect to each other in pairs.

13. Method according to one of the claims 9 to 12, in which case the rotation rates and the linear accelerations are measured as rotation rates and linear accelerations of a vehicle structure (28) moving relative to a running gear of the motor vehicle (29).

14. Method according to one of the claims 9 to 13, in which case by using a measured value measured in the wheel vehicle (20) for a linear acceleration oriented transversally to the plane of a vehicle subsurface (30) at least one part of the axle load and/or a part of the wheel load is calculated.

15. Method according to one of the claims 9 to 14, in which case by using the three rotation rates at least one part of the axle load and/or a part of the wheel load is calculated, which is generated by a rotation movement of the wheel vehicle (20) and/or by a rotation movement of a part of the wheel vehicle (20).

16. Method according to one of the claims 9 to 15, in which case with due consideration of a, in particular damped, suspension (40, 41, 43) between at least one of the wheels (21, 22, 23, 24) of the wheel vehicle (20) and a vehicle structure (28), the axle load and/or the wheel load is calculated.

17. Method for predicting a driving situation, in which case by using at least two axle loads and/or wheel loads calculated in accordance with the method according to one of the claims 9 to 16, it is possible to forecast whether or not a wheel (21, 22, 23, 24) of the wheel vehicle (20) or a plurality of wheels (21, 22, 23, 24) of the wheel vehicle (20) will lose roadholding and thus the grip to a subsurface (30).